

Appl. No. 10/676,216
Amdt. dated 10/14/2005
Reply to Office action of 09/16/2005
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-2. (canceled)

3.(original) A process for manufacturing a compound sintered article having a cavity, comprising the sequential steps of:

(a) providing a group of mixtures of powdered materials, each member of said group having, after sintering, a functional property that is different from any functional property possessed, after sintering, by any other member of the group;

(b) adding lubricants and binders to all members of said mixtures group, thereby forming a first group of feedstocks, all of whose members shrink, after sintering, by amounts that differ from one another by less than about 1%;

(c) forming a second group of feedstocks that will shrink, after sintering, by an amount that exceeds the amount that any member of said first feedstock group shrinks, after sintering, by at least 10 %;

(d) in a mold, compression molding a feedstock from either feedstock group, to form a green part;

(e) transferring said green part to a different mold and then injecting into said different mold a quantity of a different feedstock, taken from either feedstock group;

(f) repeating steps (d) and (e), each time using a different mold and a different feedstock, until all members of both feedstock groups have been molded, thereby forming a final compound green part;

(g) removing all lubricants and binders from the final compound green part to form a powder skeleton;

(h) sintering the powder skeleton; and

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(i) removing all loose parts, thereby forming the compound sintered article.

4.(original) The process described in claim 3 wherein said functional properties are selected from the group consisting of magnetic, corrosion resistant, controlled porosity, high thermal conductivity, high density, high strength, low thermal expansion, wear resistant, high elastic modulus, high damping capacity, good machinability, fatigue resistant, high hardness, high toughness, high melting point, oxidation resistant, easy joinability, and low internal stress .

5.(original) The process described in claim 3 wherein the removal of loose parts is achieved by mechanical or by chemical means.

6-9. canceled

10.(original) A process for manufacturing a wire die, comprising:

providing a first mixture of powdered materials, said mixture being, after sintering, suitable for use as a handle;

providing a second mixture of powdered materials, said mixture being, after sintering, suitable for serving as a wire drawing die;

adding lubricants and binders to said first and second mixtures to form first and second feedstocks such that the amount that said feedstocks shrink after sintering differs one from one another by less than about 1%;

providing a third mixture of powdered materials and adding thereto lubricants and binders thereby forming a third feedstock that will shrink, after sintering, by an amount that exceeds the amount that said first and second feedstocks shrink, after sintering, by at least 10 %;

using a first mold, compression molding the first feedstock to form a first green part having the shape of a handle;

transferring said first green part to a second mold and then injecting into said second mold a quantity of the third feedstock which is given a cylindrical pin-cushion shape, thereby forming, together with the first green part, a second green part;

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transferring said second green part to a third mold and then injecting into said third mold a quantity of the second feedstock that surrounds said cylindrical pin-cushion shaped portion of the second green part, thereby forming, together with the second green part, a third green part;

removing all lubricants and binders from the third green part to form a powder skeleton;
sintering the powder skeleton; and

removing all material that was formed from said third powdered mixture, thereby forming the wire die.

11.(original) The process described in claim 10 wherein removal of all material that was formed from said third powdered mixture is achieved by mechanical or by chemical means.

12.(original) The process described in claim 10 wherein said first mixture of powdered materials is selected from the group consisting of iron, all iron-based alloys, carbon steels, low-alloyed steels, and stainless steels).

13.(original) The process described in claim 10 wherein said second mixture of powdered materials is selected from the group consisting of all tool steels, water-hardening steels (Type W), shock-resisting steels (Type S), cold-work steels (Type O, A, D and H), hot-work steels (Type H), High speed steels (Type T and M), mold steels (Type P), and tungsten carbide.

14.(original) The process described in claim 10 wherein said third mixture of powdered materials is selected from the group consisting of waxes and thermoplastics.

15-24. (canceled)